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N° 10,105 A.D. 1894

Date of Application, 24th May, 1894

Complete Specification Left, 2nd Feb., 1895—Accepted, 9th Mar., 1895

PROVISIONAL SPECIFICATION.

Improvements in the Production of a Peptonized Alcoholic Beverage from Milk.

I, Alexander Bernstein, of 76, Königgrätzer Strasse, Berlin, S.W. in the Empire of Germany, Engineer, do hereby declare the nature of this invention to be as follows:—

This invention relates to the production of a peptonized alcoholic beverage from milk.

For this purpose I employ sterilized milk and peptonize the same by means of a bacteria which I designate as peptone-bacteria, and which possesses the property of peptonizing the caseine in milk without curdling and without producing decompositions unsuitable for drinking purposes. The special bacteria which I have found to be very suitable for this purpose is in the form of a very short rod (two being generally connected together) and exhibits rapid motion; these bacteria are grown in milk and the colonies cultivated on meat-peptone-gelatine are of a liquid, cloudy appearance and shew very fine rays on the circumference; such bacteria liquefy the gelatine completely; on peptone-agar they show a white slimy growth; on potatoes they produce a smooth brown skin; they do not appear to produce spores; they are destroyed by being subjected to a temperature of between 70° and 80° C.

In carrying out the peptonizing process I proceed as follows:—

A small quantity of milk, preferably skim milk (or butter-milk or whey may be used) is first completely sterilized, and then a small quantity of the peptone-bacteria, grown on agar, is added. In a few days the milk, if kept at about 20° C. becomes more transparent and liquid. In this state it is added to a larger quantity of sterilized milk and this method is carried on until the desired quantity of milk is under treatment.

If the milk is kept at between 20 and 30° C. the appearance will change in a few days. No curdling takes place but the caseine is gradually changed into albumose and peptone which are dissolved in the milk. By this process the milk becomes more transparent and at the same time a small amount of acid is formed.

I generally interrupt the process of peptonization in about a week's time.

The milk is now boiled; the peptone-bacteria are thereby killed and the caseine which was not dissolved is curdled during the boiling; the milk is then filtered. The result of the filtration is a transparent liquid of pleasant but slightly bitter taste. It contains peptones, milk-sugar, the dissolved salts of the milk and a slight amount of acid. It is very nourishing and easily digested. The colour of the liquid depends on the method of sterilizing the milk, and may be white, yellow-brown or red-brown, according to the heat used in sterilization.

The filtered liquid is poured into an open vessel and heated so as to evaporate a certain part as I find that this improves the taste.

To render the liquid alcoholic so as to improve the taste, I effect the fermentation of the sugar. On account of the peptone contained in it, the liquid is well suited to the growth of yeast-cells.

In fermenting milk-sugar I employ a yeast ordinarily employed for effecting such fermentation such as that described by Duclaux: Principes de Laiterie page 58.

[*Price* 8d.]

The juice of fruits may be added to increase the fermentation, and other substances may be used to improve the taste as is done in the preparation of wine.

Dated this 24th day of May 1894.

G. F. REDFERN & Co.,
4, South Street, Finsbury, London, Agents for the Applicant.

COMPLETE SPECIFICATION.

Improvements in the Production of a Peptonized Alcoholic Beverage from Milk.

I, ALEXANDER BERNSTEIN, of Claudius Strasse 18 Berlin, N.W. late of 76, Koniggratzer Strasse, Berlin, S.W. in the Empire of Germany, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

This invention relates to the production of a peptonized alcoholic beverage from milk.

For this purpose I first peptonize the milk by the process forming the subject of an application of even date, that is to say, in order to obtain the peptonized milk I avail myself of a bacterium which I designate as peptone bacterium and which possesses the property of peptonizing the caseine in milk without curdling and without causing decompositions which render the milk unsuitable for drinking purposes. The special bacterium which has proved to be very suitable for this purpose may be found in milk and can be isolated by the well known method of Robert Koch. It has the form of a very short rod (two other rods being generally connected together) and exhibits rapid whirling motion ; colonies on meat-peptone-gelatine are of a liquid cloudy appearance and liquefy the gelatine completely ; on meat-peptone-agar they shew a white slimy growth ; on potatoes they produce a smooth brown skin ; no spores are shewn by the ordinary method of colouring.

In carrying out my invention I proceed as follows :—A small quantity of milk, preferably separated or skim milk (or butter-milk or whey may be used) is first completely sterilized, and then a small quantity of the peptone-bacteria, grown on agar, is added. In a few days the milk, if kept at about 20° C. becomes more transparent and liquid. In this state it is added to a larger quantity of sterilized milk and this process is continued until the desired quantity of milk is under treatment.

If the milk is kept at between 20° and 30° C. its appearance will change in a few days. No curdling takes place, but the caseine is gradually changed into albumose and peptone which are dissolved in the milk. By this process the milk becomes more transparent and at the same time a small amount of acid is formed.

I generally allow the process of peptonization to continue for about a week.

The milk is now boiled whereby the peptone bacteria are killed and the caseine, which has not been dissolved, is curdled and the milk is then filtered. The filtrate is a transparent liquid of pleasant taste and contains the caseine peptones, milk-sugar, the dissolved constituents of the milk and a slight amount of lactic acid. It is very nourishing and easily digested. This filtrate will be hereinafter referred to as "galacton."

The galacton can now be advantageously used for the purpose of making an alcoholic beverage as the peptone which it contains constitutes an excellent food for the yeast-cell.

The fermentation can be carried on in any suitable manner and I have found the following give good results in practice :—

The milk-sugar contained in the galacton can be itself fermented. Formerly it was supposed that milk-sugar could not undergo alcoholic fermentation, but of late special yeasts for this purpose have been discovered. Such yeasts have already been described by Duclaux, Weigmann and others. All that is required therefore is to add yeast of this kind to the galacton, when a fermented alcoholic beverage is obtained.

But as the amount of alcohol produced in this way would not be more than about 2 °/₀, a stronger alcoholic beverage may be made by the addition of sugar. For this purpose cane sugar can be used, as the same yeast will act on milk-sugar and cane sugar.

It is, however, not necessary to add the sugar in a prepared state. Any material containing starch, which by the action of diastase has first been converted into sugar, may be advantageously employed by mixing it with galacton before fermentation takes place.

The advantage of such beverage over ordinary beer consists in the fact that the protein matter in solution can be obtained cheaper and better from milk by the process herein described than from malt. A very nourishing beer can therefore be made at comparatively low cost.

It is obvious that other substances may be added to alter the colour or improve the taste of the fermented galacton.

Although the caseine of the milk can be liquefied by other methods such as by using well known chemicals or pepsine and hydrochloric acid, the method hereinbefore described of employing peptone bacteria is the only one which yields a product suitable for drinking purposes.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is :—

1. A beverage produced from milk alone or in combination with other substances by liquefying the protein matter and fermenting the sugar, substantially as described.

2. The manufacture and use of an alcoholic beverage containing the protein matter of the milk in solution as hereinbefore described.

Dated the 2nd day of February 1895.

G. F. REDFERN & Co.,
4, South Street, Finsbury, London, Agents for the Applicant.

London: Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—1895

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[Reprint.—*This Specification has been reprinted in consequence of an Amendment made by order of the Comptroller prior to the sealing of the Patent.*]

RECORDED

DUPLICATE

N° 10,105 A.D. 1894

Date of Application, 24th May, 1894

Complete Specification Left, 2nd Feb., 1895—Accepted, 9th Mar., 1895

PROVISIONAL SPECIFICATION.

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In carrying out the peptonizing process I proceed as follows:—

A small quantity of milk, preferably skim milk (or butter-milk or whey may be used) is first completely sterilized, and then a small quantity of the peptone-bacteria, grown on agar, is added. In a few days the milk, if kept at about 20° C. becomes more transparent and liquid. In this state it is added to a larger quantity of sterilized milk and this method is carried on until the desired quantity of milk is under treatment.

If the milk is kept at between 20 and 30° C. the appearance will change in a few days. No curdling takes place but the caseine is gradually changed into albumose and peptone which are dissolved in the milk. By this process the milk becomes more transparent and at the same time a small amount of acid is formed.

I generally interrupt the process of peptonization in about a week's time.

The milk is now boiled; the peptone-bacteria are thereby killed and the caseine which was not dissolved is curdled during the boiling; the milk is then filtered. The result of the filtration is a transparent liquid of pleasant but slightly bitter taste. It contains peptones, milk-sugar, the dissolved salts of the milk and a slight amount of acid. It is very nourishing and easily digested. The colour of the liquid depends on the method of sterilizing the milk, and may be white, yellow-brown or red-brown, according to the heat used in sterilization.

The filtered liquid is poured into an open vessel and heated so as to evaporate a certain part as I find that this improves the taste.

[*Price 8d.*]

To render the liquid alcoholic so as to improve the taste, I effect the fermentation of the sugar. On account of the peptone contained in it, the liquid is well suited to the growth of yeast-cells.

In fermenting milk-sugar I employ a yeast ordinarily employed for effecting such fermentation such as that described by Duclaux: Principes de Laiterie page 58. The juice of fruits may be added to increase the fermentation, and other substances may be used to improve the taste as is done in the preparation of wine.

Dated this 24th day of May 1894.

G. F. REDFERN & Co.,
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The galacton can now be advantageously used for the purpose of making an alcoholic beverage as the peptone which it contains constitutes an excellent food for the yeast-cell.

The fermentation can be carried on in any suitable manner and I have found the following give good results in practice :—

The milk-sugar contained in the galacton can be itself fermented. Formerly it was supposed that milk-sugar could not undergo alcoholic fermentation, but of late special yeasts for this purpose have been discovered. Such yeasts have already been described by Duclaux, Weigmann and others. All that is required therefore is to add yeast of this kind to the galacton, when a fermented alcoholic beverage is obtained.

But as the amount of alcohol produced in this way would not be more than about 2 °/ₒ, a stronger alcoholic beverage may be made by the addition of sugar. For this purpose cane sugar can be used, as the same yeast will act on milk-sugar and cane sugar.

It is, however, not necessary to add the sugar in a prepared state. Any material containing starch, which by the action of diastase has first been converted into sugar, may be advantageously employed by mixing it with galacton before fermentation takes place.

The advantage of such beverage over ordinary beer consists in the fact that the protein matter in solution can be obtained cheaper and better from milk by the process herein described than from malt. A very nourishing beer can therefore be made at comparatively low cost.

It is obvious that other substances may be added to alter the colour or improve the taste of the fermented galacton.

Although the caseine of the milk can be liquefied by other methods such as by using well known chemicals or pepsine and hydrochloric acid, the method hereinbefore described of employing peptone bacteria is the only one which yields a product suitable for drinking purposes.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that I am aware that it has been proposed to prepare a fermented beverage from milk peptonized in the ordinary manner. I therefore make no claim for the production of such a beverage except in the manner above described, but what I claim is :—

1. A beverage produced from milk alone or in combination with other substances by liquefying the protein matter and fermenting the sugar, substantially as described.

2. The manufacture and use of an alcoholic beverage containing the protein matter of the milk in solution as hereinbefore described.

Dated the 2nd day of February 1895.

G. F. REDFERN & Co.,
4, South Street, Finsbury, London, Agents for the Applicant.

London : Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—1895

99. FOODS AND BEVERAGES
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